Navy Advancement Center
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Advancement Handbook for Sonar Technician (Submarine)

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PREFACE

The purpose of the Advancement Handbook is to help you focus your preparation for Navywide advancement-in-rating examinations. The bibliographies (BIBs) together with this handbook form a comprehensive examination study package. Since this handbook provides skill and knowledge components for each paygrade of the Sonar Technician (Submarine) rating, it helps you concentrate your study on those areas that may be tested. This feature will help you get the most out of your study time.

Each page in Parts 1 through 4 of this Advancement Handbook presents general skill areas, specific skill areas, the knowledge factors associated with each skill area, the pertinent references that address each skill, and the subject areas that may be covered on the examination. The skill statements describe the skills you are expected to perform for each paygrade. The skill statements are cumulative; that is, you are responsible for the skills for the paygrade you are competing for, your present paygrade, and all paygrades below.

Although this handbook is very comprehensive, it cannot cover all the tasks performed in the rating. As a result, the advancement examinations may contain questions more detailed than described in the "*Exam Expectations*" section of the skill areas.

Remember that advancement competition is keen, so your keys to advancement include not only comprehensive advancement examination study but also sustained superior performance.

Prepared by
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Part 1

Advancement Handbook for STS3

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General STS *Skill Area*	**Sonar Operations**
A *skill* you are expected to perform from the General Skill Area above:	**Line up installed sonar primary equipment to detect and track sonar contacts**
Knowledge you should have to perform this skill:	• Perform sonar operational checks • Explain theory of equipment operation • Conduct searches for and detect sonar contacts with primary systems • Identify sonar operating modes • Track sonar contacts with installed equipment • Obtain sonar equation data
References you should study to gain the knowledge you need to perform this skill:	• AN/BQQ-6 Sonar Employment Manual (*NWP 3-21.22.2)* • AN/BYS-1(v) Acoustic Subsystem Employment Manual *(NWP 3-21.22.3)* • Submarine Tracking Manual *(NWP 3-21.23)* • AN/BQQ-6 Operating Guidelines *(NWP 3-21.61.03)* • AN/BQQ-5C System Operational Description *(NWP 3-21.61.06)* • AN/BQQ-5C Operating Guidelines *(NWP 3-21.61.07)* • AN/BQQ-5D System Operational Description *(NWP 3-21.61.08)* • AN/BQQ-5D Operating Guidelines *(NWP 3-21.61.09)* • AN/BSY-1(v) Acoustic Subsystem Operational Description *(NWP 3-21.61.1)* • AN/BQQ-5E (EC-7001) System Operational Description *(NWP 3-21.61.12)* • AN/BQQ-5E (EC-7001) Operating Guidelines *(NWP 3-21.61.13)*

	• AN/BSY-1(v) Acoustic Subsystem Operating Guidelines *(NWP 3-21.61.2)* • AN/BQQ-10 (APB-98) TB-16/23 Operating Guidelines *(TM FZ 1461-3-99)* • Submarine Auxiliary and Sonar Operating Guidelines (*NWP 3-21.65.3)* • Submarine Sonar Reference Manual *(NWP 3-21.69.1)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about system variants in submarine class, equipment knobology and pre-underway checks. In addition, you will be given various scenarios that will require your analysis to determine equipment lineups for best detection and tracking.

General STS *Skill Area*	**Sonar Operations**
A *skill* you are expected to perform from the General Skill Area above:	**Line up installed sonar auxiliary equipmen to detect and track sonar contacts**
Knowledge you should have to perform this skill:	• Detect and report sonar contacts • Provide plot data to fire control • Detect evasive and acoustic jamming devices • Obtain water depth soundings • Change patch panel inputs and outputs
References you should study to gain the knowledge you need to perform this skill:	• AN/BQR-27 Operating Guidelines (*NTTP 3-21.63.6)* • AN/BQG-5 Operating Guidelines *(NTRP 3-21.61.10)* • AN/BQR-23A(V)3 (EC-8) and TB-23/BQ Operating Guidelines *(NWP 3-21.62.1)* • AN/BQR-20A and AN/BQR-22A Operating Guidelines (NWP 3-21.63.1) • AN/BQR-22A EC-17 Multibeam Signal Processing System Operating Guidelines *(NWP 3-21.63.3)* • AN/BQR-25 and AN/BQR-23 Operating Guidelines *(NWP 3-21.63.5)* • AN/WLR-9A and AN/WLR-12 Operating Guidelines *(NWP 3-21.64.1)* • AN/WLR-9A (EC-9) and AN/WLR–9B (EC-8) Operating Guidelines *(NWP 3-21.64.2)* • AN/BQS-15A Operating Guidelines *(NTTP 3-21.65.5)* • AN/BQS-14A Operating Guidelines *(NWP 3-21.65.2)* • Submarine Auxiliary and Sonar Operating Guidelines (*NWP 3-21.65.3)*

	• Submarine Arctic Operations Manual (*NWP 3-59.2)* • AFTAS II Operating Guidelines *(TM FZ 1461-1-99)* • MACDSP (Standalone) Operating Guidelines *(TM FZ 1461-2-99)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about system variants in submarine class, equipment knobology and pre-underway checks. In addition, you will be given various scenarios that will require your analysis to determine equipment lineups for best detection and tracking.

General STS *Skill Area*	**TARGET MOTION ANALYSIS**
A *skill* you are expected to perform from the General Skill Area above:	**Provide data to fire control for the fire control solution**
Knowledge you should have to perform this skill:	• Determine contact bearing • Convert true bearings to relative bearings • Convert relative bearings to true bearings • Determine contact aspect • Determine contact course and speed • Calculate contact angle on the bow • Determine sonar contact ranges • Determine contact depth (surfaced or submerged) • Compute range rate • Provide time frequency plot data to fire control • Correlate sonar contact data with other sensors • Determine closest point of approach • Identify sonar contact maneuvers • Collect antisubmarine warfare weapons firing data
References you should study to gain the knowledge you need to perform this skill:	• Submarine Sonar Reference Manual *(NWP 3-21.69.1)* • Submarine Target Motion Analysis (TMA) Techniques *(NWP 3-21.51.1)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about Fire Control terms and abbreviations, and fire control plots that pertain to the sonar room. In addition, you will be given basic TMA scenarios where you will required to solve for various components of a TMA formula.

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General STS *Skill Area*	**TARGET CLASSIFICATION**
A *skill* you are expected to perform from the General Skill Area above:	**Identify the difference between surface and submerged contacts, both threat and non-threat**
Knowledge you should have to perform this skill:	• Perform basic contact classification aurally and with installed sonar equipment • Obtain a turn count aurally and with installed sonar equipment • Identify transient noises • Identify changes in contact operating modes (engine rpm, speed, echo ranging, depth changes) • Detect acoustic jamming and evasive devices
References you should study to gain the knowledge you need to perform this skill:	• Passive Acoustic Classification Reference Manual *(NWP 1-10.22 VOL. 1)* • Passive Acoustic Classification Reference Manual (Pocket Guide) *(NWP 1-10.22 VOL. 2)* • Principles of LOFARGRAM Analysis Vol 1 *(NWP 1-10.2 VOL. 1)* • Principles of LOFARGRAM Analysis Vol 2 *(NWP 1-10.2 VOL. 2)* • Foreign Submarine Data Handbook *(NWP 1-10.21)* • Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Compendium of ACINT Products *(ONI 1259-002-00)*
Exam Expectations. These are subject areas you should know to help you answer exam questions	You can expect questions involving basic fundamentals of the physics of sound and classification principles using various auxiliary equipment. In addition, you will be tasked to

correctly:	compute shaft and blade rate, screwblade configurations, and shaft and engine rpm. You can expect questions pertaining to screwblade configuration of various combatants.

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General STS *Skill Area*	**SOUND VELOCITY PROFILE**
A *skill* you are expected to perform from the General Skill Area above:	**Obtain, record, and interpret sound velocity profiles**
Knowledge you should have to perform this skill:	• Launch submarine expendable bathythermograph (SSXBT) • Enter sound velocity profile (SVP) data into auxiliary equipment • Determine propagation paths of underwater sound • Detect ocean environmental changes
References you should study to gain the knowledge you need to perform this skill:	• Submarine Sonar Reference Manual *(NWP 3-21.69.1)* • Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Tactical Use of the Ocean Environment *(NWP 3-59.1)* • Fleet Oceanographic and Acoustic Reference Manual *(RP 33)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about sound velocity profiles and the effect the environment has on them. In addition, you may be tasked to perform general oceanographic analysis.

General STS *Skill Area*	**ACOUSTIC DATA PACKAGES**
A *skill* you are expected to perform from the General Skill Area above:	**Collect and package acoustic data**
Knowledge you should have to perform this skill:	• Log sonar contacts • Make sonar tape recordings • Annotate grams, charts, and recordings • Package data for mailing
References you should study to gain the knowledge you need to perform this skill:	• ACINT Data Collection Guide *(ONI-1259-001-00)* • DORA System Procedures Manual-Formatted Logs • Operation and Data Gathering Procedures for ACINT Recorders (*NSWCCD-73-TR-1999 / 225 NOV 1999)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about annotating acoustic displays and procedures for recording contact data. Also, questions regarding contact reports and logging contact information will be asked.

General STS *Skill Area*	**BASIC ELECTRONICS**
A *skill* you are expected to perform from the General Skill Area above:	**Isolate electronic circuits**
Knowledge you should have to perform this skill:	• Electrical safety precautions • Electrical tagout procedures • Basic analog theory • Basic digital theory • Basic test equipment usage (to include meggars, voltmeters, frequency counters, and oscilloscopes)
References you should study to gain the knowledge you need to perform this skill:	• JOINT Fleet Maintenance Manual *(CINCLANTFLT/CINCPACFLTINST 4790.3)* • Introduction to Matter, Energy, and Direct Current (NEETS MOD 1) *(NAVEDTRA B72-01-00-92)* • Introduction to Number Systems and Logic Circuits (NEETS MOD 13) *(NAVEDTRA B72-13-00-94)* • Introduction to Test Equipment (NEETS MOD 16) *(NAVEDTRA B72-16-00-96)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about electrical safety and tagout procedures, in addition to basic electronics and the application of *Ohm's Law* (analog) and Truth tables (digital).

General STS *Skill Area*	**NOISE REDUCTION**
A *skill* you are expected to perform from the General Skill Area above:	**Maintain own ship's noise reduction program**
Knowledge you should have to perform this skill:	• Update own ship's radiated noise and equipment line-up libraries • Inspect isolation components and ground straps • Inspect damping material • Perform isolation surveys • Conduct housekeeping surveys
References you should study to gain the knowledge you need to perform this skill:	• Platform Noise Monitoring Analysis for Noise Reduction on LOS ANGELES Class Submarines *(NAVSEA S9073-AR-PNM-010/(C) SSN-688CL)* • Platform Noise Monitoring Analysis for Noise Reduction *(NAVSEA S9073-AS-PNM-101/(C))* • Ship Acoustical Surveys *(NAVSEA S9073-AW-SNC-010)* • Own-Ship Radiated Noise Level Measurements *(NTRP 3-54.11 (Rev A))*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about equipment lineups for housekeeping and isolation surveys.

General STS *Skill Area*	**TOWED ARRAY OPERATIONS**
A *skill* you are expected to perform from the General Skill Area above:	**Deploy and retrieve installed towed arrays under all scenarios**
Knowledge you should have to perform this skill:	• Perform normal towed array deployment • Perform normal towed array retrieval • Perform loss of flushing water towed array deployment • Perform loss of hydraulics towed array deployment and retrieval • Perform loss of electrical towed array retrieval and deployment • Clean and inspect installed towed array handling group • Lubricate installed array handling group
References you should study to gain the knowledge you need to perform this skill:	• Applicable Operating and Casualty Procedures for all classes of submarines
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about towed array construction and the operation of towed array handling equipment.

General STS *Skill Area*	**Sonar System Maintenance**
A *skill* you are expected to perform from the General Skill Area above:	**Utilize general purpose test equipment to perform troubleshooting and maintenance on sonar equipment**
Knowledge you should have to perform this skill:	• Adjust sonar detecting and ranging equipment • Align sonar detecting and ranging equipment • Test sonar detecting and ranging equipment • Clean and inspect sonar equipment • Change paper on paper drive recorders • Check ECS flow meters or indicators for cooling water flow rates • Clean and inspect hydrophones and transducers • Clean and inspect sonar dome or sphere interiors • Inspect and replace sonar related zincs
References you should study to gain the knowledge you need to perform this skill:	• JOINT Fleet Maintenance Manual *(CINCLANTFLT/CINCPACFLTINST 4790.3)* • Introduction to Test Equipment (NEETS MOD 16) *(NAVEDTRA B72-16-00-96)* • Ships' Maintenance and Material Management (3-M) Manual *(OPNAVINST 4790.4)* • Electronics Installation & Maintenance Book- Electronic Circuits *(SE000-01-1MB-010)* • Electronics Installation & Maintenance Book- General Maintenance *(SE000-01-1MB-010)*

Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about 3M schedules and the operation of various test equipment. Also, you will be asked test equipment knobology and interpretation of test equipment displays.

Part 2

Advancement Handbook for STS2

General STS *Skill Area*	**ASW OPERATIONS**
A *skill* you are expected to perform from the General Skill Area above:	**Search, detect, and track sonar contacts**
Knowledge you should have to perform this skill:	• Determine optimum sonar suite line-up • Determine best search area • Determine best search depth • Determine best depth to avoid detection • Determine best area to avoid detection • Determine best evasion depth • Determine contact geographical position • Recommend tactical maneuvers to the Conn • Calculate best course to intercept sonar contacts
References you should study to gain the knowledge you need to perform this skill:	• AN/BQR-27 Operating Guidelines (*NTTP 3-21.63.6)* • AN/BQS-15A Operating Guidelines *(NTTP 3-21.65.5)* • AN/BQG-5 Operating Guidelines *(NWP 3-21.61.10)* • AN/BQR-23A(V)3 (EC-8) and TB-23/BQ Operating Guidelines *(NWP 3-21.62.1)* • AN/BQR-20A and AN/BQR-22A Operating Guidelines *(NWP 3-21.63.1)* • AN/BQR-22A EC-17 Multibeam Signal Processing System Operating Guidelines *(NWP 3-21.63.3)* • AN/BQR-25 and AN/BQR-23 Operating Guidelines *(NWP 3-21.63.5)* • AN/WLR-9A and AN/WLR-12 Operating Guidelines *(NWP 3-21.64.1)* • AN/WLR-9A (EC-9) and AN/WLR–9B (EC-8) Operating Guidelines *(NWP 3-21.64.2)*

	• AN/BQS-14A Operating Guidelines *(NWP 3-21.65.2)* • Submarine Auxiliary and Sonar Operating Guidelines (*NWP 3-21.65.3)* • Submarine Arctic Operations Manual *(NWP 3-59.2)* • ALLIED Manual of Submarine Operations *(ATP 18(D))* • ALLIED Antisubmarine Warfare Manual *(ATP 28(A))* • Antisubmarine Warfare (ASW) Exercises *(FXP 1)* • Tactical Considerations for Low- Frequency Active Acoustic (LFAA) Sonar Systems *(NTTP 3-54.2)* • Naval Special Warfare Submarine Operations Manual *(NWP 3-05.4)* • Minefield Detection and Avoidance *(NWP 3-15.27)* • Submarine Approach and Attack Manual *(NWP 3-21.21 (REV A))* • Submarine Search Manual (*NWP 3-21.22)* • AN/BQQ-6 Sonar Employment Manual *(NWP 3-21.22.2)* • AN/BSY-1 Acoustic Subsystem Employment Manual *(NWP 3-21.22.3)* • AN/BQQ-5E (EC-7001) Sonar Employment Manual *(NWP 3-21.22.4)* • SFMPL 6.0 Employment Manual *(TM FZ 1460-1-99)* • IMAT 4.X Employment Manual *(TM FZ 1460-1-00)* • AFTAS II Operating Guidelines *(TM FZ 1461-1-99)* • MACDSP (Standalone) Operating Guidelines *(TM FZ 1461-2-99)* • AN/BQQ-10 (APB-98) TB-16/23 Operating Guidelines *(TM FZ 1461-3-99)* • Submarine Tactical Security Manual (*NWP 3-54.1 (REV A))* • SSN Anti-Diesel Approach and Attack Supplement *(TM SZ 5561-1-99)*

Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about system variants in submarine class and the employment of them. In addition, you will be given various scenarios that will require your analysis to determine equipment lineups and placements of the arrays for best detection and tracking.

General STS *Skill Area*	**TACTICAL OCEANOGRAPHY**
A *skill* you are expected to perform from the General Skill Area above:	**Analyze tactical oceanographic data and meteorological data**
Knowledge you should have to perform this skill:	• Interpret sound velocity profile • Explain the theory of physics of sound • Explain the tactical use of fronts and eddies
References you should study to gain the knowledge you need to perform this skill:	• Submarine Sonar Reference Manual *(NWP 3-21.69.1)* • Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Tactical Use of the Ocean Environment *(NWP 3-59.1)* • Fleet Oceanographic and Acoustic Reference Manual *(RP 33)* • IMAT 4.X Employment Manual *(TM FZ 1460-1-00)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about sound velocity profiles and the effect the environment has on them. In addition, you may be tasked to perform oceanographic analysis.

General STS *Skill Area*	**CONTACT CLASSIFICATION**
A *skill* you are expected to perform from the General Skill Area above:	**Analyze target data and match with intelligence information to discern contact classification**
Knowledge you should have to perform this skill:	• Analyze gram contact data • Analyze acoustic intercept data • Check intelligence data for possible threats • Correlate contacts with intelligence data • Assign priorities to sonar contacts
References you should study to gain the knowledge you need to perform this skill:	• Acoustic Characteristics of Diesel Submarines of Selected Foreign Countries (Less Russia) (*DST 1220S-092-94)* • Submarine Characteristics of Selected Eastern European and Asian Countries *(DST 1220H-161-92)* • Acoustic Characteristics of Soviet Submarines, Type 2&3 Nuclear *(DST 1220S-461-90)* • Acoustic Characteristics of Soviet Submarines, Type 6&7 *(DST 1220S-465-92)* • Acoustic Characteristics of CIS Submarines, Type 1 thru 4 Diesel *(DST 1220S-646-93)* • In-Water Acoustic Characteristics of Russian Missiles, Counter-Measures, and Torpedoes *(DST 1260S-084-94)* • Passive Acoustic Classification Reference Manual *(NWP 1-10.22 VOL. 1)* • Passive Acoustic Classification Reference Manual (Pocket Guide) *(NWP 1-10.22 VOL. 2)* • Principles of LOFARGRAM Analysis Vol 1 *(NWP 1-10.2 VOL. 1)* • Principles of LOFARGRAM Analysis Vol 2 *(NWP 1-10.2 VOL. 2)*

	• Foreign Submarine Data Handbook *(NWP 1-10.21)* • Signature Catalog: CIS Diesel and Nuclear Submarines *(NWP 1-10.26)* • Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Compendium of ACINT Products *(ONI 1259-002-00)* • Acoustic Characteristics of Russian Surface Ships *(ONI 1259-050-98)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions involving basic fundamentals of the physics of sound and classification principles using various auxiliary equipment. You can also expect questions pertaining to lofargram analysis of worldwide submarines, surface combatants, and weapons and active sonars held on each.

General STS *Skill Area*	**SONAR AND FIRE CONTROL COORDINATION**
A *skill* you are expected to perform from the General Skill Area above:	**Coordinate data between fire control and sonar to help solve for weapons firing solution**
Knowledge you should have to perform this skill:	• Analyze underwater fire control systems contact data • Analyze plots, charts, and recorded data • Interpret ASW weapons firing data • Identify coded underwater communications • Conduct sonar pre-watch brief
References you should study to gain the knowledge you need to perform this skill:	• Submarine Target Motion Analysis (TMA) Techniques *(NWP 3-21.51.1 (REV A))* • Antisubmarine Warfare (ASW) Exercises *(FXP 1)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about Fire Control terms and abbreviations, and fire control plots that pertain to the sonar room. In addition, you will be given TMA scenarios where you will be required to solve for various components of a TMA formula.

General STS *Skill Area*	**ACOUSTIC DATA PACKAGES**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare acoustic data packages for shipment**
Knowledge you should have to perform this skill:	• Properly mark acoustic data package for shipment • Properly pack acoustic data package for shipment • Properly number acoustic data package enclosures
References you should study to gain the knowledge you need to perform this skill:	• ACINT Data Collection Guide *(ONI-1259-001-00)* • DORA System Procedures Manual-Formatted Logs • Operation and Data Gathering Procedures for ACINT Recorders (*NSWCCD-73-TR-1999 / 225 NOV 1999)* • ACINT Collection Guide *(ONI 1259-001-00)* • DON Information Security Program (ISP) Regulation *(SECNAVINST 5510.36)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about annotating acoustic displays and procedures for recording contact data. Also, questions regarding contact reports and logging contact information will be asked.

General STS *Skill Area*	**NOISE REDUCTION**
A *skill* you are expected to perform from the General Skill Area above:	**Conduct the maintenance on own ship's noise reduction program**
Knowledge you should have to perform this skill:	• Conduct radiated noise surveys • Identify characteristics and sources of self noise • Analyze acoustic trial report data • Obtain baseline acoustic data • Update baseline acoustic data • Obtain own ship's cavitation curves • Update own ship's cavitation curves • Conduct sound short isolation diagnostics
References you should study to gain the knowledge you need to perform this skill:	• Platform Noise Monitoring Analysis for Noise Reduction on LOS ANGELES Class Submarines *(NAVSEA S9073-AR-PNM-010/(C) SSN-688CL)* • Platform Noise Monitoring Analysis for Noise Reduction *(NAVSEA S9073-AS-PNM-101/(C))* • Ship Acoustical Surveys *(NAVSEA S9073-AW-SNC-010)* • Own-Ship Radiated Noise Level Measurement *(NTRP 3-54.11 (Rev A))*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about equipment lineups and own ship parameters for housekeeping and isolation surveys.

General STS *Skill Area*	**MAINTENANCE**
A *skill* you are expected to perform from the General Skill Area above:	I**solate and repair faulty digital and analog electronics**
Knowledge you should have to perform this skill:	• Troubleshoot sonar detecting and ranging equipment, auxiliary equipment, and towed arrays • Test hydrophones and transducers • Dummy load hydrophones and transducers • Perform waveform and signal measurement analysis • Inspect electrical hull fittings • Perform mainframe computer and peripheral diagnostic test • Troubleshoot synchro/servo resolver systems • Troubleshoot electrical and electronic cables and wiring • Replace and /or repair electronic connectors • Replace electrostatic discharge (ESD) sensitive components • Troubleshoot and replace analog electronic components
References you should study to gain the knowledge you need to perform this skill:	• JOINT Fleet Maintenance Manual *(CINCLANTFLT/CINCPACFLTINST 4790.3)* • Introduction to Test Equipment (NEETS MOD 16) *(NAVEDTRA B72-16-00-96)* • Ships' Maintenance and Material Management (3-M) Manual *(OPNAVINST 4790.4)* • Electronics Installation & Maintenance

	Book- Electronic Circuits *(SE000-01-1MB-010)* • Electronics Installation & Maintenance Book- General Maintenance *(SE000-01-1MB-010)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about 3M schedules and the operation of test equipment. Also, you will be asked analog and digital electronic theory, to include, but not limited to, schematic diagram reading and truth table analysis.

General STS *Skill Area*	**TECHNICAL ADMINISTRATION**
A *skill* you are expected to perform from the General Skill Area above:	**Prepare and/or update sonar reports**
Knowledge you should have to perform this skill:	• Update sonar search plan while on station • Prepare sonar program trouble reports • Conduct onboard trainer exercises
References you should study to gain the knowledge you need to perform this skill:	• Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Submarine Search Manual (*NWP 3-21.22)* • JOINT Fleet Maintenance Manual *(CINCLANTFLT/CINCPACFLTINST 4790.3)* • COMSUBLANT COMSUB PAC JOINT Training Manual *(CSL/CSPINST. C3500.1)* • Forces Afloat Supply Procedures *(NAVSUP P-485)* • SFMPL 6.0 Employment Manual *(TM FZ 1460-1-99)* • IMAT 4.X Employment Manual *(TM FZ 1460-1-00*)
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about sonar search plan development, sonar training administration, 3M administration, and supply procedures

Part 3

Advancement Handbook for STS1

General STS *Skill Area*	**ASW OPERATIONS**
A *skill* you are expected to perform from the General Skill Area above:	**Supervise ASW operations**
Knowledge you should have to perform this skill:	• Conduct ASW attacks as a sonar supervisor • Conduct ASUW attacks as a sonar supervisor • Recommend tactical employment of towed arrays • Recommend procedures to reduce own ship's detectability
References you should study to gain the knowledge you need to perform this skill:	• Submarine Arctic Operations Manual *(NWP 3-59.2)* • ALLIED Manual of Submarine Operations *(ATP 18(D))* • ALLIED Antisubmarine Warfare Manual *(ATP 28(A))* • Antisubmarine Warfare (ASW) Exercises *(FXP 1)* • Naval Special Warfare Submarine Operations Manual *(NWP 3-05.4)* • Minefield Detection and Avoidance *(NWP 3-15.27)* • Submarine Approach and Attack Manual *(NWP 3-21.21 REV A)* • Submarine Search Manual (*NWP 3-21.22)* • Submarine Tactical Security Manual (*NWP 3-54.1 (REV A))* • Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Tactical Use of the Ocean Environment *(NWP 3-59.1)* • Fleet Oceanographic and Acoustic Reference Manual *(RP 33)*

	• IMAT 4.X Employment Manual *(TM FZ 1460-1-00)* • SSN Anti-Diesel Approach and Attack Supplement *(TM SZ 5561-1-99)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions pertaining to, but not limited to, various approach and attack scenarios. Own ships maneuvers for launch and post launch will also be asked.

General STS *Skill Area*	**MAINTENANCE**
A *skill* you are expected to perform from the General Skill Area above:	**Supervise sonar equipment maintenance**
Knowledge you should have to perform this skill:	• Qualify as departmental 3-M assistant (305) • Review QA packages for completeness • Plan a Shipyard Restricted Availability (SRA) Maintenance period for sonar division
References you should study to gain the knowledge you need to perform this skill:	• JOINT Fleet Maintenance Manual *(CINCLANTFLT/CINCPACFLTINST 4790.3)* • Ships' Maintenance and Material Management (3-M) Manual *(OPNAVINST 4790.4)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect detailed questions about the 3M system and the planning required for various upkeep periods.

General STS *Skill Area*	**NOISE REDUCTION**
A *skill* you are expected to perform from the General Skill Area above:	**Analyze and correct noise discrepancies**
Knowledge you should have to perform this skill:	• Analyze acoustic discrepancy data • Coordinate correction of acoustic discrepancies • Analyze own ship's cavitation curve data for discrepancies
References you should study to gain the knowledge you need to perform this skill:	• Platform Noise Monitoring Analysis for Noise Reduction on LOS ANGELES Class Submarines *(NAVSEA S9073-AR-PNM-010/(C) SSN-688CL)* • Platform Noise Monitoring Analysis for Noise Reduction *(NAVSEA S9073-AS-PNM-101/(C))* • Ship Acoustical Surveys *(NAVSEA S9073-AW-SNC-010)* • Own-Ship Radiated Noise Level Measurements *(NTRP 3-54.11 (Rev A))*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about analyzing own ships detectability, and acoustic reports. Also, you can expect questions about Noise Reduction Program administration.

General STS *Skill Area*	**TECHNICAL ADMINISTRATION**
A *skill* you are expected to perform from the General Skill Area above:	**Maintain divisional logs, records, and message traffic**
Knowledge you should have to perform this skill:	• Prepare sonar division short range training plan • Prepare sonar division long range training plan • Prepare sonar search plans • Prepare sonar messages • Interpret sonar messages
References you should study to gain the knowledge you need to perform this skill:	• Submarine Acoustic Data Manual *(NWP 3-21.69.2)* • Submarine Search Manual (*NWP 3-21.22)* • JOINT Fleet Maintenance Manual *(CINCLANTFLT/CINCPACFLTINST 4790.3)* • COMSUBLANT COMSUB PAC JOINT Training Manual *(CSL/CSPINST. C3500.1)* • Operational Reports *(NWP 1-03.1)*
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect detailed questions about the administration of the Training Manual and the Sonar Search Manual. In addition, you will be asked questions about sonar messages and when they are received and sent.

Part 4

Advancement Handbook for STSC

General STS *Skill Area*	**SONAR OPERATIONS**
A *skill* you are expected to perform from the General Skill Area above:	**Test, evaluate, and recommend changes to new and existing sonar doctrine.**
Knowledge you should have to perform this skill:	• Evaluate operational tests of new sonar equipment • Evaluate onboard trainer exercises • Evaluate experimental ASW doctrine • Recommend changes to ASW doctrine
References you should study to gain the knowledge you need to perform this skill:	• Applicable Documentation
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about procedures for evaluating onboard training exercises.

General STS *Skill Area*	**NOISE REDUCTION**
A *skill* you are expected to perform from the General Skill Area above:	**Analyze Data**
Knowledge you should have to perform this skill:	• Analyze acoustic trial report data • Analyze acoustic discrepancy data
References you should study to gain the knowledge you need to perform this skill:	• Applicable Class Reports
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about procedures for analyzing acoustic data.

General STS *Skill Area*	**TECHNICAL ADMINISTRATION**
A *skill* you are expected to perform from the General Skill Area above:	**Review Quality Assurance (QA) packages.**
Knowledge you should have to perform this skill:	• Review Quality Assurance (QA) packages
References you should study to gain the knowledge you need to perform this skill:	• CINCLANTFLT/CINCPACFLTINST 4790.3 (VOLUME V) Quality Maintenance of the JOINT Fleet Maintenance Manual
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about specific QA forms and procedures.

Appendix 1

References Used in This Advancement Handbook

Short Title	Long Title	Stocking Point
ATP 18(D)	ALLIED Manual of Submarine Operations	Note 1
ATP 28(A)	ALLIED Antisubmarine Warfare Manual	Note 1
CINCLANTFLT/ CINCPACFLTINST 4790.3	JOINT Fleet Maintenance Manual	Note 5
COMSUBLANT/ COMSUBPAC INST. C3500.1	COMSUBLANT COMSUB PAC JOINT Training Manual	Note 7
DORA MANUAL	DORA System Procedures Manual-Formatted Logs	Note 8
DST 1220H-161-92	Submarine Characteristics of Selected Eastern European and Asian Countries	Note 8
DST 1220S-092-94	Acoustic Characteristics of Diesel Submarines of Selected Foreign Countries (Less Russia)	Note 8
DST 1220S-461-90	Acoustic Characteristics of Soviet Submarines, Type 2&3 Nuclear (w/ Ch 1, 2)	Note 8
DST 1220S-465-92	Acoustic Characteristics of Soviet Submarines, Type 6&7 (w/ Ch 1,2)	Note 8
DST 1220S-646-93	Acoustic Characteristics of CIS Submarines, Type 1 thru 4 Diesel (w/ Ch 1,2)	Note 8
DST 1260S-084-94	In-Water Acoustic Characteristics of Russian Missiles, Counter-Measures, and Torpedoes	Note 8
FXP 1	Antisubmarine Warfare (ASW) Exercises	Note 2
NAVEDTRA 12044	Military Requirements for Petty Officer Third Class	Note 1
NAVEDTRA 12018	Military Requirements, Basic	Note 1
NAVEDTRA 12045	Military Requirements for Petty Officer Second Class	Note 1
NAVEDTRA 12046	Military Requirements for Petty Officer First Class	Note 1
NAVEDTRA 12047	Military Requirements for Chief Petty Officers	Note 1
NAVEDTRA 172-08-00-82	Introduction to Amplifiers (NEETS MOD 8)	Note 1
NAVEDTRA 172-09-00-83	Introduction to Wave-Generation and	Note 1

	Wave-Shaping Circuits (NEETS MOD 9)	
NAVEDTRA 172-12-00-83	Modulation Principles (NEETS MOD 12)	Note 1
NAVEDTRA 172-14-00-84	Introduction to Microelectronics (NEETS MOD 14)	Note 1
NAVEDTRA 172-20-00-85	Master Glossary and Index (NEETS MOD 20)	Note 1
NAVEDTRA B72-01-00-92	Introduction to Matter, Energy, and Direct Current (NEETS MOD 1)	Note 1
NAVEDTRA B72-02-00-91	Introduction to Alternating Current and Transformers (NEETS MOD 2)	Note 1
NAVEDTRA B72-03-00-93	Introduction to Circuit Protection, Control, and Measurements (NEETS MOD 3)	Note 1
NAVEDTRA B72-04-00-92	Introduction to Electrical Conductors, Wiring Techniques and Schematic Reading (NEETS MOD 4)	Note 1
NAVEDTRA B72-05-00-94	Introduction to Generators and Motors (NEETS MOD 5)	Note 1
NAVEDTRA B72-06-00-92	Introduction to Electronic Emission, Tubes, and Power Supplies (NEETS MOD 6)	Note 1
NAVEDTRA B72-07-00-92	Introduction to Solid-State Devices and Power Supplies (NEETS MOD 7)	Note 1
NAVEDTRA B72-13-00-94	Introduction to Number Systems and Logic Circuits (NEETS MOD 13)	Note 1
NAVEDTRA B72-15-00-93	Principles of Synchros, Servos, and Gyros (NEETS MOD 15)	Note 1
NAVEDTRA B72-16-00-96	Introduction to Test Equipment (NEETS MOD 16)	Note 1
NAVEDTRA B72-19-00-92	The Technician's Handbook (NEETS MOD 19)	Note 1
NAVEDTRA B72-21-00-87	Test Methods and Practices (NEETS MOD 21)	Note 1
NAVEDTRA B72-22-00-88	Introduction to Digital Computers (NEETS MOD 22)	Note 1
NAVEDTRA B72-23-00-91	Magnetic Recordings (NEETS MOD 23)	Note 1
NAVSEA S9073-AR-PNM-010/(C) SSN-688CL	Platform Noise Monitoring Analysis for Noise Reduction on LOS ANGELES Class Submarines	Note 1
NAVSEA S9073-AS-PNM-101/(C)	Platform Noise Monitoring Analysis for Noise Reduction	Note 1
NAVSEA S9073-AW-SNC-010	Ship Acoustical Surveys	Note 1

NAVSUP P-485	Forces Afloat Supply Procedures	Note 1
NSWCCD-73-TR-1999 / 225 NOV 1999	Operation and Data Gathering Procedures for ACINT Recorders	Note 8
NWP 1-01	The Naval Warfare Publication System	Note 2
NWP 1-03.1	Operational Reports	Note 2
NWP 1-10.2 VOL. 1	Principles of Lofargram Analysis Vol 1	Note 2
NWP 1-10.2 VOL. 2	Principles of Lofargram Analysis Vol 2	Note 2
NWP 1-10.21	Foreign Submarine Data Handbook	Note 2
NWP 1-10.22 VOL. 1	Passive Acoustic Classification Reference Manual	Note 2
NWP 1-10.22 VOL. 2	Passive Acoustic Classification Reference Manual (Pocket Guide)	Note 2
NWP 1-10.26	Signature Catalog: CIS Diesel and Nuclear Submarines	Note 2
NWP 3-15.27	Minefield Detection and Avoidance	Note 2
NWP 3-21.21 Rev A	Submarine Approach and Attack Manual	Note 2
NWP 3-21.22	Submarine Search Manual	Note 2
NWP 3-21.22.2	AN/BQQ-6 Sonar Employment Manual	Note 2
NWP 3-21.22.3	AN/BSY-1 Acoustic Subsystem Employment Manual	Note 2
NWP 3-21.22.4	AN/BQQ-5E (EC-7001) Sonar Employment Manual	Note 2
NWP 3-21.22.5	Non-AN/BQQ-6 Sonar Employment Manual	Note 2
NWP 3-21.23	Submarine Tracking Manual	Note 2
NWP 3-21.51.1 (Rev A)	Submarine Target Motion Analysis (TMA) Techniques	Note 2
NTRP 3-21.53.3 (Rev A)	Evasion, Pyrotechnic, and Signal Devices Reference Manual	Note 2
NWP 3-21.61.03	AN/BQQ-6 Operating Guidelines	Note 2
NWP 3-21.61.06	AN/BQQ-5C System Operational Description	Note 2
NWP 3-21.61.07	AN/BQQ-5C Operating Guidelines	Note 2
NWP 3-21.61.08	AN/BQQ-5D System Operational Description	Note 2
NWP 3-21.61.09	AN/BQQ-5D Operating Guidelines	Note 2
NWP 3-21.61.1	AN/BSY-1(v) Acoustic Subsystem Operational Description	Note 2
NTRP 3-21.61.10	AN/BQG-5 Operating Guidelines	Note 2
NWP 3-21.61.12	AN/BQQ-5E (EC-7001) System Operational Description	Note 2
NWP 3-21.61.13	AN/BQQ-5E (EC-7001) Operating Guidelines	Note 2
NWP 3-21.61.2	AN/BSY-1(v) Acoustic Subsystem Operating	Note 2

	Guidelines	
NWP 3-21.62.1	AN/BQR-23A(V)3 (EC-8) and TB-23/BQ Operating Guidelines	Note 2
NWP 3-21.63.1	AN/BQR-20A and AN/BQR-22A Operating Guidelines	Note 2
NWP 3-21.63.3	AN/BQR-22A EC-17 Multibeam Signal Processing System Operating Guidelines	Note 2
NWP 3-21.63.4	AN/BQR-7 Operating Guidelines	Note 2
NWP 3-21.63.5	AN/BQR-25 and AN/BQR-23 Operating Guidelines	Note 2
NTTP 3-21.63.6	AN/BQR-27 Operating Guidelines	Note 2
NWP 3-21.64.1	AN/WLR-9A and AN/WLR 12 Operating Guidelines	Note 2
NWP 3-21.64.2	AN/WLR-9A (EC-9) and AN/WLR–9B (EC-8) Operating Guidelines	Note 2
NWP 3-21.65.2	AN/BQS-14A Operating Guidelines	Note 2
NWP 3-21.65.3	Submarine Auxiliary and Sonar Operating Guidelines	Note-2
NTTP 3-21.65.5	AN/BQS-15A Operating Guidelines	Note 2
NWP 3-21.69.1	Submarine Sonar Reference Manual	Note 2
NWP 3-21.69.2	Submarine Acoustic Data Manual	Note 2
NWP 3-54.1 (Rev A)	Submarine Tactical Security Manual	Note 2
NTRP 3-54.11 (Rev A)	Own-Ship Radiated Noise Level Measurement	Note 2
NTTP 3-54.2	Tactical Considerations for Low- Frequency Active Acoustic (LFAA) Sonar Systems	Note 4
NWP 3-59.1	Tactical Use of the Ocean Environment	Note 2
NWP 3-59.2 (Rev A)	Submarine Arctic Operations Manual	Note 2
ONI 1259-001-00	ACINT Collection Guide	Note 8
ONI 1259-002-00	Compendium of ACINT Products	Note 8
ONI 1259-050-98	Acoustic Characteristics of Russian Surface Ships	Note 8
OPNAVINST 4790.4	Ships' Maintenance and Material Management (3-M) Manual	Note 6
OPNAVINST 5100.19	Navy Safety Precautions for Forces Afloat	Note 6
RP 33	Fleet Oceanographic and Acoustic Reference Manual	Note 3
SE000-01-1MB-010	Electronics Installation & Maintenance Book- Electronic Circuits	Note 1
SE000-01-1MB-010	Electronics Installation & Maintenance Book- General Maintenance	Note 1
SE610-AW-MMA-010 UYK-7	UYK-7 Technical Manuals	Note 1

SECNAVINST 5510.30A	DON Personnel Security Program	Note 9
SECNAVINST 5510.36	DON Information Security Program (ISP) Regulation	Note 9
TM FZ 1460-1-99	SFMPL 6.0 Employment Manual	Note 2
TM FZ 1460-1-00	IMAT 4.X Employment Manual	Note 2
TM FZ 1461-1-99	AFTAS II Operating Guidelines	Note 2
TM FZ 1461-2-99	MACDSP (Standalone) Operating Guidelines	Note 2
TM FZ 1461-3-99	AN/BQQ-10 (APB-98) TB-16/23 Operating Guidelines	Note 2
TM SZ 5561-1-99	SSN Anti-Diesel Approach and Attack Supplement	Note 2

NOTE 1 — To order, MILSTRIP to NAVICP PHILA or via INTERNET http://www.nll.navsup.navy.mil

NOTE 2 — To order, MILSTRIP to NAVICP PHILA or via NWEL Series CD-ROMS' (See your command NWP Custodian)

NOTE 3 — National Imagery & Mapping Agency (NIMA)
3200 South Second St.
St. Louis, MO 63188-3399

NOTE 4 — NTIC Series A CD ROM's (See your command NWP Custodian)

NOTE 5 — Via INTERNET http://www.submepp.navy.mil/PRODSERV.HTM

NOTE 6 — Via INTERNET http://www.nll.navsup.navy.mil or http://neds.nebt.daps.mil

NOTE 7 — Letter request to Commander, Submarine Force, U.S. Atlantic Fleet, 7958 Blandy Rd, Norfolk, Va. 23551-2492

NOTE 8 — To order send Command letter to: Commander, Office of Naval Intelligence, 4251 Suitland Road, Washington D.C. 20395-5720

NOTE 9 — Via INTERNET http://www.navysecurity.navy.mil